



An ISO 9001  
Company

## Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

### ENQUIRY

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	Enquiry Number:	Enquiry Date:	Due date for submission of quotation:
	2620800047	28.06.2008	28.07.2008

You are requested to quote the Enquiry number date and due date in all your correspondences. This is only a request for quotation and not an order

Item	Description	Quantity	Delivery (Item required at BHEL on)
10	10 Ton Battery Operated Power Trolley as per the technical specification & commercial conditions applicable (to be downloaded from web site <a href="http://www.bhel.com">www.bhel.com</a> or <a href="http://tenders.gov.in">http://tenders.gov.in</a> )	02 Nos.	30.04.2009
<b>BHEL commercial terms &amp; conditions with Price Bid and Bank Guarantee formats along with technical specifications can be downloaded from BHEL web site <a href="http://www.bhel.com">http://www.bhel.com</a> or from the Government tender website <a href="http://tenders.gov.in">http://tenders.gov.in</a> (public sector units &gt; Bharat Heavy Electricals Limited page) under Enquiry reference “2620800047”.</b>			
Tenders should reach us before 14:00 hours on the due date Tenders will be opened at 14:30 hours on the due date Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present		Yours faithfully, For BHARAT HEAVY ELECTRICALS LIMITED  Manager / Capital Equipment / MM	

**PART A****10 TON BATTERY OPERATED POWER TROLLEY****SECTION – I : QUALIFYING CRITERIA**

The BIDDER has to compulsorily meet the following requirements to get qualified for considering the technical offer for the 10 Ton Battery Operated Power Trolley

<b>S. No.</b>	<b>REQUIREMENTS</b>	<b>VENDOR's RESPONSE</b>
1	<p>Only those vendors (OEMs), who have supplied and commissioned at least <b>ONE BATTERY OPERATED POWER TROLLEY – 10 Ton Or Higher</b> in the past ten years (on the date of opening of Tender) and such machine is presently working satisfactorily for more than one year after commissioning (on the date of opening of Tender) should quote.</p> <p>However, if such trolley has already been supplied to BHEL, then that trolley should be presently working satisfactorily for more than six months after its commissioning and acceptance (on the date of opening of Tender).</p>	
<b>The vendor should submit following information where similar machine has been supplied for qualification of their offer.</b>		
1.1	Name and postal address of the customer or company where similar power trolley is installed.	
1.2	Name and designation of the contact person of the customer.	
1.3	Phone, FAX no and email address of the contact person of the customer.	
1.4	Month and Year of commissioning of the power trolley.	
1.5	Application for which the trolley is supplied	
1.6	Performance certificate from the customer regarding satisfactory performance of power trolley supplied to them. A suggested format for performance certificate is enclosed in SECTION - IV	
2.0	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	

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**SECTION – I I**

The BIDDER / VENDOR is requested to provide the following information:

<b>S. No.</b>	<b>REQUIREMENTS</b>	<b>VENDOR's RESPONSE</b>
3.0	The BIDDER/VENDOR to furnish Reference List of Customers, with full address, details of contact person, where BATTERY OPERATED POWER TROLLEY have been supplied in the past.	
4.0	Details of BATTERY OPERATED POWER TROLLEY S supplied to other BHEL units, if any. (Year of commissioning, Load Carrying Capacity)	
5.0	Details on SERVICE-AFTER-SALES Set-Up in India including the Address of Agents / Service Centers in South India.	
6.0	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

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**SECTION – III**

The BIDDER to note:

<b>S. No.</b>	<b>PARTICULARS</b>	<b>VENDOR'S RESPONSE</b>
7.0	The BIDDER / VENDOR shall submit the offer in TWO PARTS. 1. Technical Offer [with PART A & PART B] & Commercial Offer 2. Price Bid.	
8.0	The Technical Offer shall contain a comparative statement of Technical <b>Specifications demanded by BHEL</b> and <b>Offer Details submitted by the Bidder</b> , against each clause. A just 'CONFIRMED' or 'COMPLIED' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement may lead to disqualification of the Technical Offer.	
9.0	The Technical Offer shall be supported by product Catalogues & Data Sheets and also technical details of Bought-Out-Items with copies of Product Catalogue to the extent possible.	
10.0	The Commercial Offer (given with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation.	

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**SECTION – IV**

The performance certificate should be produced **on Customer's Letter Head.**

**PERFORMANCE CERTIFICATE**

1. Supplier of the machine		
2. Make & Model of the Trolley		
3. Month & Year of Commissioning		
4. Application for which the Trolley is used		
5	a) Trolley Load Carrying capacity  b) Power Supply (Battery operated / other)  c) Trolley Size	
6. Performance of the Trolley (Strike off whichever is not applicable)		Best in the market / Satisfactory / Good / Average / Not Satisfactory
7. Any Other remarks		
<div style="display: flex; justify-content: space-between; align-items: flex-end; padding-top: 20px;"> <div>Date:</div> <div>Signature &amp; Seal of the Authority Issuing the Performance Certificate</div> </div>		

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**PART B. TECHNICAL SPECIFICATIONS FOR BATTERY OPERATED POWER TROLLEY**  
***[CARRYING CAPACITY: 10 Tons]***

**QTY : 2 Nos.**

<b>S.No.</b>	<b>PARTICULARS</b>	<b>BHEL SPECIFICATIONS</b>	<b>VENDOR's TECHNICAL OFFER (With Complete Details)</b>
<b>1.0.0</b>	<b>APPLICATION</b>	a. The proposed Trolley is intended for material handling, within a large and heavy fabrication industry, on steel rails embedded in the shop floor. b. The Trolley will be put to use for continuous duty [three shifts in a day and for all the 365 days in an year]. c. The shop floor environment will be dust prone, humid, welding fume filled and ambient temperature going up to 45° C.	
<b>2.0.0</b>	<b>SCOPE OF SUPPLY</b>	a. Design, Manufacture and supply as per BHEL Tender Specifications. b. Assembly and Running Test before Dispatch, at Supplier's Works. c. Commissioning and Performance Prove-Out at BHEL Works d. Mechanical & Electrical Spares e. Performance Guarantee for 12 months, from the date of commissioning.	
<b>3.0.0</b>	<b>TECHNICAL SPECIFICATIONS</b>		
<b>3.1.0</b>	Capacity	10,000 kgs. [10 Tons]	
<b>3.2.0</b>	Rail Track Gauge	1676 mm [Broad Gauge]	
<b>3.3.0</b>	Trolley Platform Length	4000 mm	
<b>3.4.0</b>	Trolley Platform Width	2200 mm	
<b>3.5.0</b>	Height from Rail Level	800 mm [Loading Platform Level]	
<b>3.6.0</b>	No of Axles	Two	
<b>3.7.0</b>	Wheel Tread Diameter	500 mm	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
3.8.0	Motor :	DC series motor Min. 3.5 HP Operating Voltage : 36V	
3.9.0	Haulage Speed	Up to 30 mtrs. / min.	
3.10.0	Battery	36V, 5 hr Rating.	
4.0.0	<b>CONFIGURATION &amp; CONSTRUCTION</b>		
4.1.0	Basic Design	The Trolley shall be configured to run on BG [Broad Gauge] track with a sturdy steel structure, powered with a suitable DC motor (in conjunction with a gearbox and battery) and provided with controls, operator console, battery charger, etc., as per the details given under the following clauses.	
4.2.0	<b>Trolley CARRIAGE</b>	<ul style="list-style-type: none"> <li>a. The under frame shall be fabricated out of steel rolled beams and sections by welding.</li> <li>b. The top shall be covered with chequered steel plates of adequate thickness (not less than 8 mm) to withstand load capacity of the Trolley. – <b>Vendor to specify plate thickness.</b></li> <li>c. The main members shall be adequately reinforced to withstand shock loads encountered in service.</li> </ul>	
4.2.1	Raw Material	<ul style="list-style-type: none"> <li>a. Steel plates used shall have test certificates.</li> <li>b. Test Certificates to be produced for BHEL verification and form part of the documentation.</li> </ul>	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
4.2.2	Welding Electrodes	a. For all Horizontal Welding E 7018 Electrode only should be used. b. For all Vertical Welding E 7048 Electrode only should be used.	
4.2.3	Welded Joint Testing	All Butt Welded Joints (if carried out/though not preferred by BHEL) shall be subjected to 100% X-Ray Testing and X-Ray Films to be produced for BHEL verification and form part of the documentation.	
4.2.4	Bottom Clearance	The bottom most part of the components mounted under the trolley carriage shall have a minimum ground clearance of 100 mm.	
4.2.5	Suspension system	The Trolley frame shall rest on the axle box through a suspension system with helical coil springs to eliminate shocks being transferred from rail to the under frame during operation.	
4.2.6	Battery Compartment	The battery compartment shall be protected from damage by means of guard plates	
4.2.7	Attachments	The below listed attachments are to be compulsorily provided with the Trolley	
4.2.8.1	Buffers	Two each of spring-loaded buffers with rubber pads shall be provided at both ends of the transfer car.	
4.2.8.2	Coupler	Hook type couplers are to be provided at both ends, for shunting purposes.	
4.2.8.3	Lifting Hooks	Adequate number of lifting hooks shall be provided for transporting / lifting the transfer car by means of overhead cranes	
4.2.9	Side Supports Pockets	3 Nos. of support pockets with inside dimension of 75mm x 75 mm shall be provided on each side of the trolley to accept side-support pipes	



S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
4.3.0	DRIVE SYSTEM	<ul style="list-style-type: none"> <li>a. The drive shall consist of totally enclosed DC Series motor coupled to the totally enclosed gearbox and drive the wheel through axle-mounted heavy-duty gearbox.</li> <li>b. The speed control shall be through armature resistance control.</li> <li>c. Three-step speed in either direction shall be provided.</li> <li>d. DC magnetic brake shall be provided.</li> <li>e. The power to the motor shall be supplied from the batteries mounted in a steel tray under the trolley itself.</li> </ul>	
4.3.1	Traction Motor Make	Motor make shall be of reputed make. BIDDER has to specify make and rating.	
4.3.2	Track Rail Size	ISR 90 Lbs./Yard (For ref. – Rails will be supplied by BHEL)	
4.3.3	Brake	Fail safe electro-magnetic brake shall be provided for instantaneous stopping.	
4.3.4	Gear-Box	<ul style="list-style-type: none"> <li>a. The gear box housing shall be fabricated out of steel plates.</li> <li>b. The housing shall be of split design to facilitate easy assembly &amp; maintenance.</li> <li>c. The mating surfaces shall be blue matched. Vendor to ensure leak-proof joint.</li> <li>d. The housing shall be stress relieved after fabrication.</li> <li>e. The gears, shafts, bearings and other components in the gear box shall be so designed as to deliver the loading conditions specified.</li> </ul>	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
4.3.5	Wheel and Axle	<ul style="list-style-type: none"> <li>a. Cast steel wheels as per IS 2707 Gr II of defect free and finish machined on running tread, flange and bore shall be provided.</li> <li>b. The tread shall be induction hardened to 300 to 350 BHN.</li> <li>c. Axles shall be of forged steel.</li> </ul>	
4.4.0	<b>CONTROL SYSTEM</b>	<ul style="list-style-type: none"> <li>a. DC Motor shall be provided with resistance control for speed and torque control.</li> <li>b. The resistance value shall be selected so that the motor delivers required torque while starting and current is kept within the permissible safe limit.</li> <li>c. Heavy-duty electro magnetic contactors shall be used to include and remove the resistance in the circuit.</li> <li>d. The control shall be by push buttons mounted in the control console.</li> <li>e. The driver console shall be provided with cover and lock and key to avoid unauthorized operation.</li> </ul>	
4.4.1	Main Control	Master controller with Dead-Man handle mounted at the driver's platform at one end of the trolley.	
4.4.2	Remote Control	Pendant type hand held Remote Control Unit with 5 mtr. long cable with quick-fix end connectors.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
4.5.0	<b>BATTERY</b>	a. Battery shall be accommodated in the transfer car suitably for easy maintenance, charging & replacement. b. Traction Batteries assembled in steel trays lined with FRP as per IS 5154.	
4.5.1	Battery Charging	Supplier shall charge the battery at site. Sufficient quantity of electrolyte and suitable Charger shall also be supplied along with the battery.	
4.5.2	Battery Power Rating	36V DC, 300 AH 5 Hr rating Storage Type, Traction Duty, Lead Acid Battery	
4.5.3	Battery Make	Storage Battery shall be of reputed make only. BIDDER has to specify make & rating of the Battery.	
4.6.0	<b>BATTERY CHARGER</b>	Suitable for 36 V, 300 AH Lead Acid Battery.  Charger shall have the following features:  a. Constant current equalizing facility with auto cut-off. b. Protection for reverse battery, over current and short circuit. c. Free standing, self – compensating, and 100% automatic charging. d. Charging current and charging voltage indication. e. On delay start.	
4.6.1	Input Electric Power	The battery charger shall be suitable for input electric supply through a 415VAC $\pm$ 10%, 50Hz $\pm$ 3% from 3 Phase, 3 Wire System. [No neutral conductor]	
4.6.2	Power Cable	10 mtr. long charging cable of adequate size, with end connectors, shall be supplied	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
4.7.0	<b>SAFETY PROTECTIONS</b>	The following safety protections shall be compulsorily provided: 1. Overload Protection. 2. Short Circuit Protection. 3. Dead Man Control. 4. Key Switch. 5. Hooter. 6. Charger Isolation. 7. Reverse Interlock. 8. Over Speed Protection. 9. Emergency Stop.	
4.8.0	<b>SURFACE CLEANING</b>	All the fabricated parts shall be de-rusted and degreased (by shot blasting or chemical treatment for surface cleaning), after completion of all operations but prior to painting.	
4.9.0	<b>PAINTING</b>	The Steel fabricated parts are to be painted as follows: a. One coat of Primer. b. Two coats of Enamel Paint (Colour – Golden Yellow). c. The front and rear portions shall be painted with yellow and black stripes.	
5.0.0	<b>SPARES</b>	The BIDDER has to compulsorily list down the Mechanical, Electrical and Electronic Spares with Unit Rate, which are to be procured for three years of continuous operation of the Trolley with the Remote Control Unit.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
<b>6.0.0</b>	<b>DOCUMENTS/DETAILS for APPROVAL</b>	The following documents and details are to be submitted for BHEL Approval, prior to taking up the manufacture of the Transfer Car.	
<b>6.1.0</b>	Drawings and Documents	<ul style="list-style-type: none"> <li>a. GA Drawing of the Transfer Car / Trolley.</li> <li>b. Trolley Dimensional Drawing.</li> <li>c. Sub-Assembly Drawing for Wheel &amp; Axles, Gear Boxes, etc.</li> <li>d. Calculations for Selection of Electric Motor and Gearbox.</li> <li>e. Electrical Drawings.</li> <li>f. Schematic Drawing of Trolley Controls.</li> <li>g. Battery Charger Schematic Drawing.</li> <li>h. Total Weight of the Transfer Car including all Electrical Equipment.</li> </ul>	
<b>7.0.0</b>	<b>O &amp; M MANUALS</b>	<p>Each Trolley shall be provided with</p> <ul style="list-style-type: none"> <li>a. Complete set of Tools required for Operational Maintenance,</li> <li>b. 3 Copies of Operation &amp; Maintenance Manual hard copy &amp; one soft copy in CD, [containing the following technical details, given under Clause <b>Sl. No. 7.1.0</b>]</li> </ul>	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
7.1.0	Drawings & Details	<ul style="list-style-type: none"> <li>a. Trolley General Arrangement Drawing</li> <li>b. Assembly Drawing for Wheel &amp; Axle, Gear-Box Assembly, etc.</li> <li>c. Electric Wiring Schematics</li> <li>d. Detailed Wiring Diagram for Sub-Systems / Control Panels</li> <li>e. Battery Charger Schematic Drawing.</li> <li>f. Specifications / Ratings of All Bought-Out Items</li> <li>g. Trouble Shooting Chart for all Systems</li> <li>h. List of Spares – both Mechanical and Electrical</li> </ul>	
8.0.0	<b>INSPECTION</b>	<p>Schedule of Inspection at supplier's works:</p> <ul style="list-style-type: none"> <li>a. Verification of Test Certificate for Raw Materials used for fabrication.</li> <li>b. Verification of X-Ray Report of Butt-Joints and Random Testing of the Welds, by physical examination.</li> <li>c. Verification of Trolley Dimensions, Checking of Wheel Alignment, Mechanical Assemblies and Total Alignment.</li> <li>d. Speed / Traverse Motion Testing without load</li> </ul> <p>Schedule of Inspection at BHEL:</p> <ul style="list-style-type: none"> <li>a. Full / Rated Load Test.</li> <li>b. 10% OVER-LOAD Carrying Ability Check. There should be no drop in haulage speed, motor should not get over-heated and there shall be no abnormal sound in the drive system.</li> </ul>	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
9.0.0	<b>ERECTION &amp; COMMISSIONING</b>		
9.1.0	Mechanical Erection / Assembly	Erection / Assembly of the Transfer Car has to be done by the Representative of the Supplier, at BHEL Works	
9.2.0	Commissioning	Commissioning of the Transfer Car and Performance Prove –Out for the Trolley's Capacity and Smooth Running (at BHEL Works) shall be the RESPONSIBILITY of the supplier.	
10.0.0	<b>PERFORMANCE GUARANTEE</b>	The Performance of the Trolley and/or the Components / Sub-Assemblies / Bought-Out-Items shall be guaranteed for a minimum period of twelve months from the date of performance acceptance at BHEL Works.	